

Claims

[c1] What is claimed is:

1. An organic light emitting diode (OLED) comprising:
a bottom substrate comprising a bottom electrode positioned on an upper surface of the bottom substrate, an organic layer positioned on a predetermined region of the bottom electrode, a top electrode positioned on the organic layer, and a spot glue region positioned on the bottom substrate and outside the predetermined region of the bottom electrode;
a top substrate positioned parallel with the bottom substrate, and a lower surface of the top substrate comprising at least one first ditch formed within the top substrate; and
a sealing material positioned on the spot glue region of the bottom substrate for binding the top substrate and the bottom substrate together;
wherein the first ditch is used to prevent the sealing material from overflowing into the predetermined region of the bottom substrate and affecting normal operation of the OLED.

[c2] 2. The OLED of claim 1 wherein the bottom substrate comprises a glass substrate, a plastic substrate, or a metal substrate.

[c3] 3. The OLED of claim 1 wherein the top substrate comprises a glass substrate, a glass container, or a metal container.

[c4] 4. The OLED of claim 1 wherein the bottom electrode comprises indium tin oxide (ITO) or indium zinc oxide (IZO), and functions as a anode of the OLED.

[c5] 5. The OLED of claim 1 wherein the top electrode comprises magnesium (Mg), aluminum (Al), lithium (Li) or an alloy of Mg, Al, and Li, and functions as an cathode of the OLED.

[c6] 6. The OLED of claim 1 wherein the organic layer further comprises a hole transport layer (HTL) positioned on the bottom electrode, an emitting layer (EML) positioned on the HTL, and an electron transport layer (ETL) positioned on the EML.

[c7] 7. The OLED of claim 6 further comprising a hole injection layer (HIL) positioned

[c8]

between the bottom electrode and the HTL.
8. The OLED of claim 6 further comprising an electron injection layer (EIL) positioned between the ETL and the top electrode.

[c9]

9. The OLED of claim 1 wherein the sealing material is composed of epoxy.

[c10]

10. The OLED of claim 1 wherein the first ditch is positioned within the top substrate corresponding to the bottom substrate and between the spot glue region and the predetermined region, and a depth of the first ditch is less than half of a thickness of the top substrate.

[c11]

11. The OLED of claim 1 wherein the OLED further comprises at least one second ditch positioned within the bottom substrate and between the spot glue region and the predetermined region, and a depth of the second ditch is less than a thickness of the bottom substrate.

[c12]

12. The OLED of claim 1 wherein the OLED further comprises at least one third ditch positioned within the bottom electrode and between the spot glue region and the predetermined region, and a depth of the third ditch is less than a thickness of the bottom electrode.

[c13]

13. The OLED of claim 1 further comprising a desiccating agent positioned in the OLED to prevent the organic layer of the OLED from moistening.

[c14]

14. An organic light emitting device that comprises at least two organic light emitting diodes (OLEDs), the organic light emitting device comprising:
a bottom substrate comprising at least two device regions, and a segmented region between two adjacent device regions positioned on an upper surface of the bottom substrate, each device region comprising a bottom electrode positioned on the device region, an organic layer positioned on an active region of the device region, and a top electrode positioned on the organic layer;
a top substrate positioned parallel with the bottom substrate, a lower surface of the top substrate comprising at least two first regions corresponding to the device regions of the bottom substrate, at least one second region corresponding to the segmented region of the bottom substrate, and a plurality

of first ditches positioned within each first region of the top substrate; and a sealing material positioned on a spot glue region of the bottom substrate and outside each active region for binding the top substrate and the bottom substrate together; wherein the first ditches are used to prevent the sealing material from overflowing into the segmented region and each active region of the bottom substrate and affecting normal operation of each OLED.

- [c15] 15. The organic light emitting device of claim 14 wherein the bottom substrate comprises a glass substrate, a plastic substrate, or a metal substrate.
- [c16] 16. The organic light emitting device of claim 14 wherein the top substrate comprises a glass substrate, a glass container, or a metal container.
- [c17] 17. The organic light emitting device of claim 14 wherein the bottom electrode comprises indium tin oxide (ITO) and indium zinc oxide (IZO), and functions as a anode of each OLED.
- [c18] 18. The organic light emitting device of claim 14 wherein the top electrode comprises magnesium (Mg), aluminum (Al), lithium (Li), and an alloy of Mg, Al, and Li, and functions as an cathode of each OLED.
- [c19] 19. The organic light emitting device of claim 14 wherein the organic layer further comprises a hole transport layer (HTL) positioned on the bottom electrode, an emitting layer (EML) positioned on the HTL, and an electron transport layer (ETL) positioned on the EML.
- [c20] 20. The organic light emitting device of claim 19 further comprising a hole injection layer (HIL) positioned between the bottom electrode and the HTL.
- [c21] 21. The organic light emitting device of claim 19 further comprising an electron injection layer (EIL) positioned between the ETL and the top electrode.
- [c22] 22. The organic light emitting device of claim 14 wherein the sealing material is composed of epoxy.
- [c23] 23. The organic light emitting device of claim 14 wherein the first ditches are

positioned within the top substrate corresponding to the bottom substrate and between the spot glue region and the predetermined region, and a depth of each first ditch is less than half of a thickness of the top substrate.

- [c24] 24. The organic light emitting device of claim 14 wherein the organic light emitting device further comprises at least one second ditch positioned within the bottom substrate and between the spot glue region and the predetermined region, and a depth of the second ditch is less than a thickness of the bottom substrate.
- [c25] 25. The organic light emitting device of claim 14 wherein the organic light emitting device further comprises at least one third ditch positioned within the bottom electrode and between the spot glue region and the predetermined region, and a depth of the second ditch is less than a thickness of the bottom electrode.
- [c26] 26. The organic light emitting device of claim 14 wherein a width of the segmented region is larger than twice a width of each first ditch.
- [c27] 27. The organic light emitting device of claim 14 further comprising a desiccating agent positioned in each OLED to prevent the organic layer of each OLED from moistening.